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The JOURNAL of GEOGRAPHY

A MAGAZINE FOR TEACHERS

VOLUME XIX NUMBER 4

APRIL, 1920

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THE JOURNAL OF GEOGRAPHY

A MAGAZINE FOR TEACHERS

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The subscription price is one dollar a year, payable in advance. The price of a single copy is 15 cents.

The *Journal of Geography* is the official organ of the National Council of Geography Teachers and it is sent to all members of the organization. The annual dues, $1.00, are payable to the American Geographical Society.

The *Journal of Geography* is also sent to teachers who are Fellows of the Society. Annual dues are $10.00.

The *Journal of Geography* and the *Geographical Review* may be obtained by teachers at the combination price of $5.00 a year.

Remittances should be made payable to the American Geographical Society. Notification of change of address should be made promptly, both the new and the old addresses being given.

Published Monthly except June, July, and August

BY

THE AMERICAN GEOGRAPHICAL SOCIETY

BROADWAY AT 156th STREET

NEW YORK, N. Y.

Entered as second-class matter January 15, 1919, at the Post Office at New York, N. Y., under the Act of March 3, 1879

Vol. 19, No. 4 — Press of Douglas Taylor & Co., New York — April, 1920

The JOURNAL *of* GEOGRAPHY

VOLUME XIX APRIL, 1920 NUMBER 4

BEET SUGAR PRODUCTION IN NEBRASKA

By ESTHER S. ANDERSON
University of Nebraska

On the basis of production and nutritive value, sugar ranks next to rice and wheat among the world's foodstuffs.[1] Before the war the world's sugar supply came almost equally from the temperate zone, in the form of beet sugar, and the tropical and subtropical zones, in the form of cane sugar. In the United States both kinds are produced, but our home-grown sugar is far from meeting the demands of consumption: we are in fact the heaviest importers of sugar. In the year preceding the war we produced 733,000 tons (short tons, i.e. of 2,000 lbs.) of beet sugar and 300,000 tons of cane sugar and imported 3,306,000 tons. Our tropical possessions, Hawaii, Porto Rico, and the Philippines, are all large exporters, and we are advantageously situated with regard to Cuba, the world's leading exporter of sugar. But this does not take the place of domestic independence, and we have learned from the war the precariousness of dependence on foreign sources for staple foods. On this ground increase of our output of domestic sugar has been earnestly advocated, and the question arises as to which of our two sugar cultivations, cane or beet, shall be extended.

RISE OF THE BEET SUGAR INDUSTRY IN THE UNITED STATES

The figures quoted above for our sugar production in 1913 show a fact that is not perhaps generally recognized—that our production of beet sugar is greatly in excess of cane sugar. Today the sugar output of both California and Colorado closely

[1] G. B. Roorbach: The World's Food Supply, *Annals Amer. Acad. of Polit. and Soc. Sci.*, Vol. 75, 1917, Nov. Philadelphia.

approaches that of Louisiana, our traditional sugar state. The area climatically suitable for raising sugar cane in the United States is restricted, and, although the actual acreage devoted to

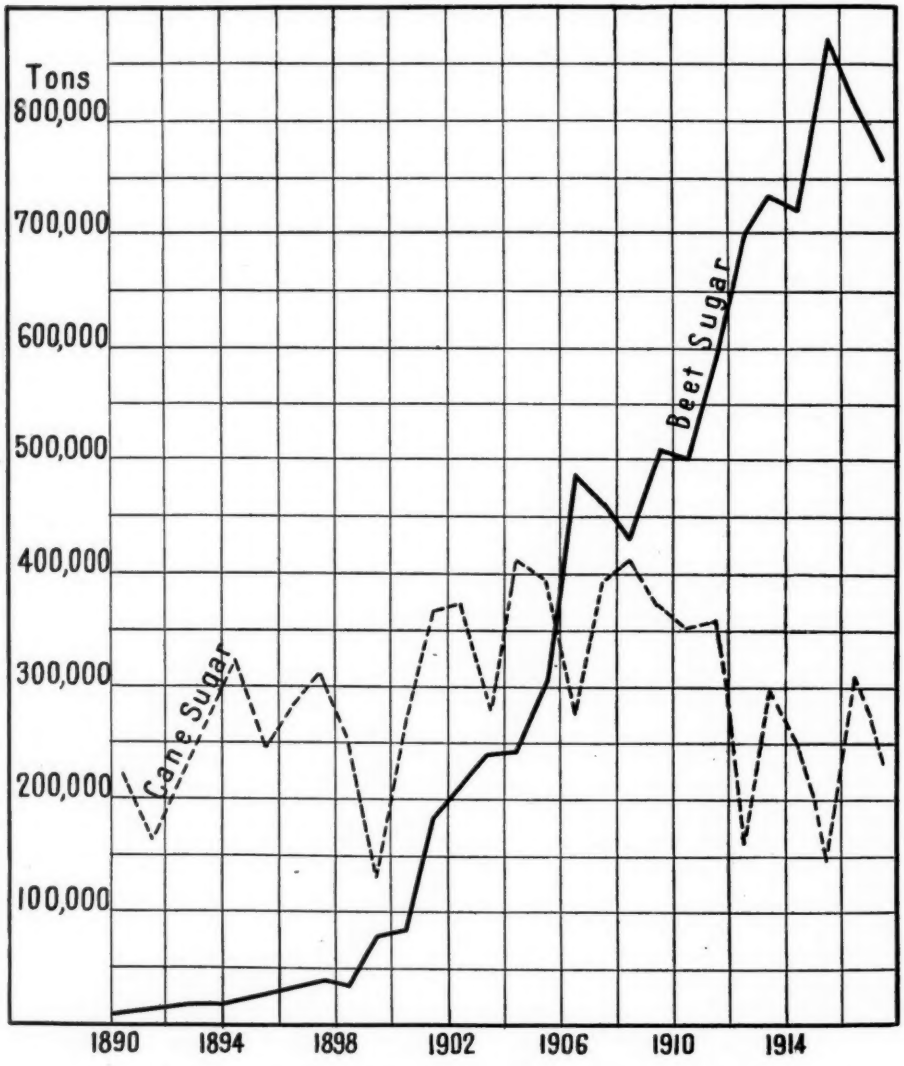

FIG. 1—Graph showing production of beet sugar and cane sugar in the United States from 1890-1891 to 1917-1918.

the crop does not reach the limits, various economic factors militate against its expansion.[2] Our cultivation of the sugar beet on

[2] J. Russell Smith: Industrial and Commercial Geography, Henry Holt & Co., New York, 1913, pp. 281-283.

the contrary is in its infancy, and its possibilities are far wider. Though we have made tentative efforts at the cultivation for nearly a century, establishment of our beet sugar industry dates back only some 30 years. The average production during the years 1886-1887 and 1890-1891 was under 2,000 tons; within the next five years the average was increased tenfold (see graph, Fig. 1).[3] In 1879, at Alvarado, California, our first successful beet sugar factory started its career after an earlier failure. Today the states of California, Colorado, Michigan, Utah, Nebraska, Idaho, Ohio, Wisconsin each have several sugar factories; Washington and Wyoming have three each; and Illinois, Indiana, Iowa, Kansas, Minnesota, and Montana have one each. As will be shown later this wide distribution of the beet sugar factories is indicative of the wide area in our country over which beet sugar cultivation is possible.

Aside from its rapid growth and future prospects the beet sugar industry merits the attention of the geography teacher because of the part it can play in the national economy. Sugar beet cultivation is a very distinctive type of agriculture, and it gives rise to distinctive social consequences. This has been well described by the French geographer, Jean Brunhes, who says[4]:

> This plant [the sugar beet] which is at the same time food plant, forage plant, and industrial plant, has played a special rôle in the history of modern agriculture. It has had, we may say, a psychological influence of capital importance. It is one of the cultivations which most quickly and most manifestly recompense the cultivator for the trouble taken in improving and fertilizing the land for its cultivation. In general it leads the cultivator to the knowledge and practice of new methods. Rendering a return in proportion to the effort expended, it encourages progress. It has also contributed to the creation of an easy bond between agriculture, pure and simple, and industry. In certain countries, France and Germany, by the reduction of transport to a minimum and the elimination of intermediaries, it has led to a type of association which represents the ideal towards which all industrial cultivations should tend.

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[3] F. S. Harris: The Sugar-Beet in America, The Macmillan Co., New York, 1919, pp. 320-321.

[4] L'homme et la terre cultivée, *Bull. Soc. Neuchâteloise de Géogr.*, Vol. 12, 1900, pp. 219-260; reference on pp. 223-225. A comparison of the sugar beet and the sugar cane in respect of the differences in production and the social and economic consequences involved is suggested as a particularly instructive topic in economic geography.

> Then again, even when the valuable roots of the beet have gone to the factory, the cultivation is not entirely lost to the land. The leaves and the residues left from the extraction of sugar or alcohol furnish an excellent fodder for stock or a rich fertilizer for the soil. Thus the cultivation enters in the cycle of activity of a wisely exploited land, not exhausted to the profit of industry as is the case with its rival of the warm and humid lands, the sugar cane.

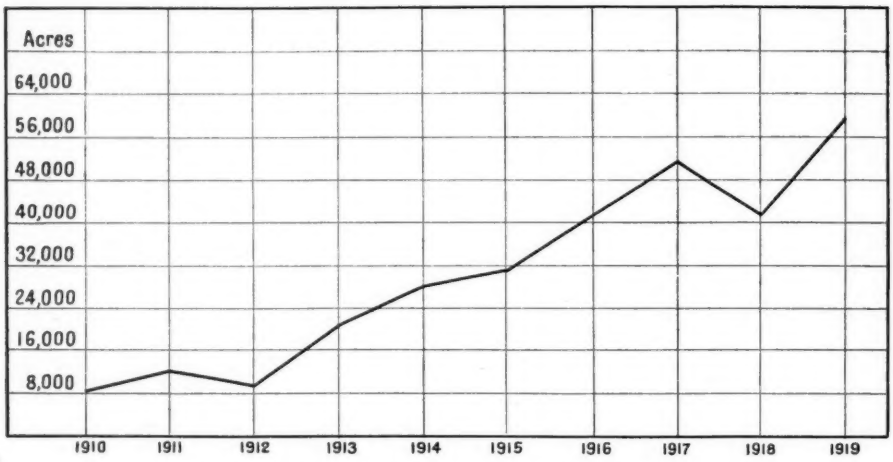

FIG. 2—Graph showing the annual acreage of sugar beets in Nebraska from 1910 to 1919.

THE SUGAR BEET IN NEBRASKA

In our own country the economic geography of the sugar beet may be well illustrated from its place in Nebraska, and this will now be described.[5]

Nebraska was one of the pioneer states in the production of sugar beets and beet sugar. The second successful sugar plant in the United States was erected at Grand Island in 1890. The first year this factory had an output of 500 tons of granulated sugar. Production fluctuated during a period of experimentation, but the industry is now firmly established in the state. There are three more factories, at Scottsbluff (1910), Gering (1916), and Bayard (1917), and the establishment of others is projected.

In 1918, 42,746 acres of beets were raised in Nebraska yielding more than 453,266 tons of beets having a sugar content of 16.05

[5] For comparison with a European area see Eugene Van Cleef: The Sugar Beet in Germany, with Special Attention to its Relation to Climate, *Bull. Amer. Geogr. Soc.*, Vol. 47, 1915, pp. 241-258; 334-341.

per cent. During 1919, 60,191 acres were grown from which were harvested approximately 580,284 tons of beets with a sugar content of 13.72 per cent. It is estimated that the 1919-1920 campaign (the industrial season, from late September to early February) will produce more than 135,000,000 pounds of sugar as compared with 127,192,000 pounds in the 1918-1919 campaign. The average

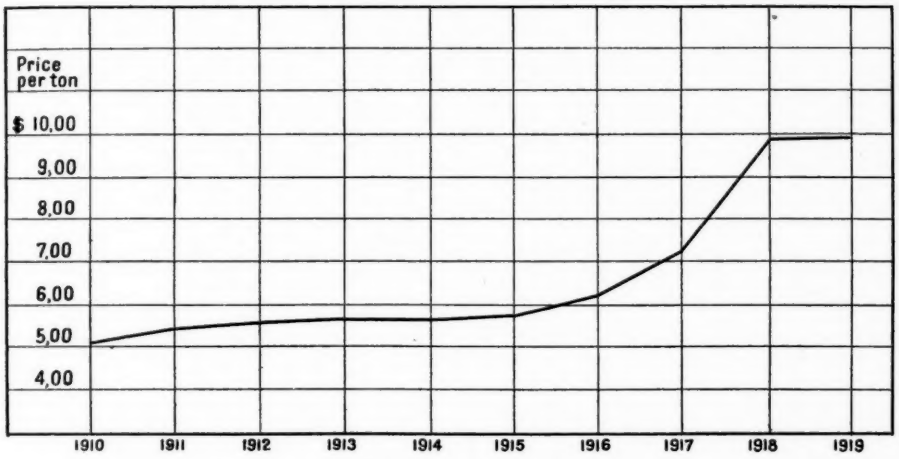

FIG. 3—Graph showing average price per ton paid for sugar beets in Nebraska from 1910 to 1919.

price paid per ton was $9.96 in 1918 and 1919. In addition the farmers are given $.50 to $1.00 per ton for siloing the beets in the field. The crop has increased in value from $408,809 in 1910 to $5,779,000 (estimated) in 1919. The number of acres of beets grown and the price paid per ton from 1910 to 1919 are shown by the accompanying graphs (Figs. 2 and 3).

SUGAR BEET CULTIVATION; ENVIRONMENTAL FACTORS

Of the environmental factors controlling the successful production of sugar beets one of the most important is climate. -Sugar beets reach their highest development in the north temperate latitudes. As far as temperature alone is concerned, experiments have proved that beets attain their greatest perfection in a zone of varying width through the center of which passes the summer (June, July, August) isothermal line of 70° F. A larger tonnage can be produced farther south, but the sugar content is lower. Beets require a long day with plenty of sunshine during the grow-

ing season. Abundant moisture is needed in the early growth of the plants to insure roots of good size, and this should be followed by a period of less rainfall, more sunshine, and cool nights for the development and storage of sugar. The climatic conditions of the irrigated districts of western Nebraska, eastern Colorado, and Wyoming are almost ideal, as there is an abundance of sunshine during most of the year and the amount of water can be regulated to suit the needs of the plant. Farther east in the Platte valley near Grand Island, Kearney, and Gibbon there is usually sufficient rainfall for the successful growth of sugar beets without much dependence on irrigation. However, when there is not enough rain in the growing season the tonnage of beets is lowered; and on the other hand the percentage of sugar is often lessened, as there may be too much rain and not enough sunshine during the maturing season.

As regards other environmental factors, topography and soil, the requirements are less exacting. A reasonably smooth topography with good drainage is best suited for the cultivation. The wide, comparatively smooth valleys of the Platte, the North Platte, and the Republican Rivers of western Nebraska fulfill these conditions and are producers of high quality beets. The beet can be grown in a variety of soils. The best, however, are deep, fine sandy and silt loams which have enough humus to insure fertility. The soils should be well drained and at the same time should be capable of holding sufficient moisture for the needs of the plants. The subsoil should be pervious to water but not so coarse as to allow too rapid percolation which will result in the leaching of plant foods from the surface soil. Inasmuch as the soils of the terraces of the above-mentioned valleys are well drained and usually contain the necessary soil ingredients, they are desirable lands for the growth of beets.

Beet Culture

The raising of sugar beets requires more intensive farming than is necessary for wheat and most other farm crops. The hand labor involved, for instance, is estimated at ten times that for wheat. In the preparation of the seed bed the soil is as thoroughly pulverized as that of a flower bed. During April and May the

seed is planted in rows 20 to 22 inches apart. Cultivation is begun as soon as the young plants are up so that the rows can be seen. During May and June the young beets are blocked and thinned to a distance of about 12 inches apart in the rows. This work is done mostly by hand, women and children doing the greater part of it. The beets are then cultivated and hoed at intervals until they become so large that further cultivation would injure them by breaking the leaves. After the last cultivation furrows are made between the rows for irrigation. The fields are irrigated from two to four times a season according to the amount of rainfall.

The ripening beets are tested for sugar content, and when they contain a certain percentage of sugar, usually 12 per cent or more, they are ready to be harvested. The harvest is begun in the latter part of September and continues into October and November. The beets are lifted from the ground by machines called diggers after which the workers who did the thinning and hoeing are again brought into the fields to do the pulling, piling, and topping, the last-named process consisting in the cutting off of the crown of the beet. The beets are then ready for delivery to the factory. If the farmer cannot make immediate delivery the beets are stored in silos in the fields until the rush is over.

MANUFACTURE OF BEET SUGAR AND BY-PRODUCTS

In the factory the beets are washed and sliced, and the juices are extracted and filtered. The sugar is crystallized out, refined, packed in 100-pound bags, and either placed in storage or shipped to markets. Besides satisfying the needs of the state, the Nebraska sugar is marketed in North and South Dakota, Minnesota, Iowa, Illinois, Missouri, Oklahoma, and Arkansas.

The most important by-products of the industry are beet tops, molasses, and pulp. The beet tops are very nutritious. They are first used in the early fall as a covering for the beets until these can be delivered. Later they are used as a green forage for cattle and sheep. It has been shown that an acre of beet tops from a normal crop properly taken off produces as much food as half an acre of corn silage. Molasses, the waste juice with too low a sugar content to be worth refining, and the pulp also have nutritive value and are used as feed to supplement alfalfa or other roughage.

Lime cake, a residue produced during the process of filtering the beet juices, and potash, a by-product recently recovered from the manufacture, are valuable fertilizers.

AGRICULTURAL AND INDUSTRIAL RELATIONS

In the introduction to this article allusion was made to the close relation between agriculture and industry in the production of beet sugar. Flour may be milled thousands of miles from the wheat fields, but the sugar beet cannot be carried economically over long distances to the factory. Furthermore, the beet farmer must be something of a specialist. He must grow for a market where the demand is clearly defined beforehand. The close relation between farm and factory means that the beets are usually grown under contract.

Each sugar company has a field superintendent in charge of a number of field men whose duties are to advise and oversee the work of the growers. In the fall and winter the field men make contracts with the farmers for a certain number of acres of beets to be raised and delivered to the factory at a stated price. Each Nebraska farmer produces from 35 to 38 acres of beets as compared with 20 to 22 acres for each grower in Colorado. By adding the acreages of contracts the sugar company knows exactly how many acres of beets will be grown during the year, and, since the tonnage per acre and the percentage of sugar vary little from year to year, the managers are able to make adequate preparation for the handling of the crop at the factory in the fall. Contracts are also made for the labor required during the harvesting seasons. In Nebraska this is furnished chiefly by Germans and Russians, who are accustomed to the work in the countries from which they have emigrated, and by Japanese and Mexicans. This farming under contract gives a highly stabilized form of agriculture which furthermore tends to general improvement in the scale of living.

Perhaps one of the fundamental factors in the furtherance of modern improvements is the added fertility which is made available in the soil through the cultivation of sugar beets. They require deep plowing and careful tillage and this results in the thorough aeration of the soil and also makes it possible for the

water to circulate more freely between the particles of soil. When beets are used in crop rotation the yields of wheat, oats, and other crops are greatly increased.

SOCIAL RELATIONS AS RESULT OF THE SUGAR BEET INDUSTRY

Among the social and economic achievements which have resulted from the sugar beet industry are the development of railroads, good roads, cities, schools, churches, and modern farms.

The sugar beet industry has led to much freight traffic, and hence the railroads are being extended and improved. The railroads not only haul beets from the dumps to the factories and deliver sugar to the markets, but also carry a heavy tonnage of coal, coke, limestone, and sulphur used in the manufacturing processes. In the manufacture of 95,362,100 pounds of sugar 40,295 tons of coal, 1890 tons of coke, 20,295 tons of limestone, and 4 carloads of sulphur were used. Cattle and sheep furnish heavy freight tonnage as thousands of each are raised on grazing lands in the Sand Hills of Nebraska or on the plains and in the foothills of Colorado and Wyoming. Then they are shipped to the beet districts of Nebraska and Colorado to be fed alfalfa and beet pulp. Most of the fattened stock is delivered either to the markets in Omaha or in Denver.

The passenger traffic is also augmented. Every spring there is an exodus of beet workers from Omaha, Lincoln, Hastings, and other large centers of population to the beet areas. The laborers work in the beet fields in the summer and then return to the cities in the fall where they send their children to school while they themselves engage in some other work.

Since automobiles and wagons are the principal means of travel, much attention is being given to the improvement of roads. Beets are hauled long distances in the large wagons, and hence it is necessary to have good transportation facilities in order that the farmers may be able to deliver their crops at a minimum expense and loss of time. Big horses are the chief sources of power, but trucks and tractors are gradually coming into use.

Cities and towns have developed where there were formerly a few stopping places for the ranchers to obtain their mail and to purchase supplies. Scottsbluff, Gering, Bayard, Minatare,

Mitchell, Bridgeport, Morrill, and other towns have grown rapidly during the last few years.

The people are giving more attention to education than formerly. In Scottsbluff County several modern high schools and grade schools have been erected. The teacherages and the Smith-Hughes system of agricultural training are among the newest ideas of rural education already realized. The rural teachers receive good salaries, some over $100 per month. That higher education is not being neglected is evidenced by the fact that each year many students from the cities and farms attend the colleges and schools of Nebraska and other states. Churches of nearly every denomination are available to the residents of the beet areas.

Thus owing largely to the development of the beet sugar industry, the fertile valleys of western Nebraska have taken position among the richest agricultural sections of the state.

THE TEACHING OF THE GEOGRAPHY OF A SMALL AREA*

By A. E. PARKINS
George Peabody College for Teachers, Nashville, Tenn.

What the small area should be is naturally the first question that arises. Should it be a city, a city and the surrounding rural district naturally tributary to it, a county, a quadrangle, or a natural geographic unit? Under certain conditions any one of these may possess advantages over the others.

From a theoretical geographic standpoint the natural region forms the best unit. It particularly lends itself to the problem method of study and discussion. The similarity of geographic conditions and responses makes it possible to select a problem or at most a few problems under which most of the geography

* This paper (here somewhat abbreviated) formed one of a series read at the St. Louis Meeting of the National Council of Geography Teachers (1919). The other papers were "Geography of a Country," by E. E. Lackey, and "Geography of a Continent," by W. M. Gregory.

of the region can be incorporated. The county as a unit, however, possesses certain distinct advantages. Statistical data on population, agriculture, manufacturing, and other items are available. For many counties county atlases have been published, and soil maps issued, and base maps are readily obtainable.

Whatever be the unit selected for study of the small area, much field work is presupposed. Natural geographic regions sufficiently small to enable field work to be carried on advantageously and with a minimum of expense are not found in every part of our country. Most of us must be content with our local environment and must try to get out of it as much geographic material as time and transportation conditions will permit. Experience has shown that for furnishing usable illustrative material to supplement the regular formal courses or for furnishing foundational types to be used later in the interpretation of distant regions and other geographic phenomena, the local area, or the local urban center and the surrounding lands, constituting what we may call the local environment, is as valuable as any unit.

LOCAL GEOGRAPHY AS AN ADVANCED STUDY

The study of the local environment, under the title "home geography," has long had a place in the curricula of our elementary schools; but it has undoubtedly been the least taught of all phases of geography. In most schools the subject matter is supposed to be covered during the third and fourth year. Rarely is any phase of local phenomena studied in the higher grades; but, as every trained geographer knows, in regions rich in geographic material most of the fundamental principles and notions of geography may be developed out of the local environment. More than this, many such regions supply much material for advanced work in economic, commercial, historical, and what may be called "civic" geography. Our institutions for the training of teachers should especially offer more work in local geography, consisting largely of field work. Many of our higher institutions have for the last five or six years offered field work in local geography aside from the established courses in physiography. A few have established summer camps for intensive study of small areas, the geography course following the geology course of the same area.

It is the advanced phases of field work of a small area that I want to discuss. Stated in question form the topic is: "What type of work, aside from field work in physiography and geology, may be done in the local environment?"

Regions vary greatly in the richness of their material. Suggestions that are applicable for one section of the country would not be suitable at all for others. In the discussion that follows, the writer is thinking mainly of the region in which he has worked the last three years with classes in field geography.

This region embraces the city of Nashville, the Cumberland River, and that portion of the surrounding country readily reached by train, trolley, or automobile. We thus have two distinct types of environment for study: a rural and an urban. Let us first consider the rural environment.

The Rural Area

Lying in the northwestern portion of the Nashville Basin, only a few miles from the Highland Rim, the city affords access to three distinct types of topography: (1) a basin type with hills, plains, and valleys; (2) a ridge and valley type; (3) a plateau type.

Collecting Data by a Reconnaissance

The more detailed study of these type regions is preceded by a reconnaissance trip over the Basin and up on the Highland Rim. The work on the reconnaissance excursion and the later detailed study of the three type regions may be motivated by a problem which seeks to compare geographic influences affecting agricultural conditions in those three type regions. The problem is introduced of course after a clear exposition of the main differences in topography as revealed by the topographic map. The following outlines are suggested topics on which data should be collected for each of the type regions, partly in the field and partly from reliable library sources. We shall probably be unable to secure data on all the items suggested, and some of the data called for may not help in solving the problem; but field experience shows that one rarely uses all the data in one's field notebook.

The items suggested are:

I. Topography: degree of dissection of the land; angle of slope; relief; kinds of bed rock; influence of topography on size of farms, on size of cultivated fields, on shape and continuity of farms, on percentage of farms in forest, pasture, and cultivated fields, on drainage, and on cost of transportation on the farm.

II. Soil: type; depth; color; thickness of top soil; porosity; extent of erosion; tendency to erode; permanence and fertility; tractability; fertilizer needs; retention of fertilizer; influence of soil and topography on the value of the land.

III. Climate and natural vegetation: date of spring opening; length of growing season; frequency and duration of droughts; frequency of crop failures from frosts, droughts, and excessive rain; fitness of the region for fruit; dominant types of vegetation; cost of preparation of new lands for cultivation.

IV. Crops: variety grown; labor requirements; date of planting; methods of tillage and harvesting; possibility of other crops; rotation practices; size and kind of buildings needed for storage; average size of farm; percentage of land in farms; percentage of land improved on each; ownership of the land; system of tenancy; labor supply.

V. Contact with markets: location of barns and storage houses with respect to roads; road conditions; road-making material; distance from trading centers, both large and small.

VI. The people: nationalities represented; education and moral standards; distribution; isolated dwellings; rural communities, their development and differentiation; religious and political affiliations; ownership of land; supply and quality of labor; social intercourse and community life; extent of and co-operation in economic and social activities.

The problem will also call for the brief consideration of the possible returns on the money invested. Although this is an economic problem, its solution involves a consideration of geographic conditions. (Many of these topics are sociological, yet in the regions studied they are geographically influenced and in greater or less degree are of vital concern in our problem).

INTENSIVE STUDY OF A FARM

An understanding of the agricultural conditions of a region may be obtained by an intensive study of a typical farm, the type being determined after a reconnaissance trip as suggested above. The

intensive study of some particular farm will undoubtedly yield better results than the superficial study of a large area.

What may a class do in the geographic study of a farm? A rough map of the farm ought to be made showing the boundaries of the fields with kinds of crops (indicated by symbols), pasture lands, wood lots, areas of thin soil, steep slopes, streams, marshlands, springs, natural drainage lines, and location of buildings.[1] A contour map would be very serviceable, especially where the relief is sufficient to influence the use made of the land. Most of the problems for investigation may well center on the map. Why are certain areas left in wood lots? Why others in pastures? What influence has topography on the use of the land, on methods of tillage, on location of buildings? Are the buildings well located? This calls for a consideration of natural drainage, of the protection from cold winds, the value of sunlight in the home and in the stables as well, and the correct spacing and location of the buildings to minimize the danger from fire. Information should be secured on the effect of droughts, frosts, and floods on crops; on the influence of slope on the temperature of the ground and how this affects the rate of development of crops and use of the land; on rotation practices; on fertilizers used and their source; on the farm equipment of machinery and of necessary buildings; on the kinds, quality, and quantity of live stock; on the cost of fences and on the source and character of material used. The source and sanitary conditions of the war supply both for domestic use and for stock are worth attention. In addition, many of the topics suggested above in the study of a rural community may be considered here in greater detail.

Intensive Study of a Rural Region

Studies of rural regions in which property lines are neglected and emphasis is laid on the influence of topography on the use of the land may be equally as detailed. As applied to the Nashville region such topographic types as small valley flats, large valley flats, moderate slopes, glade lands, interstream uplands, and others form units within the larger area. In this work there

[1] See the maps illustrating the article by Carl O. Sauer, "Mapping the Utilization of the Land," *Geogr. Rev.*, July, 1919.

would be ample scope for mapping, preferably with the use of a contour map for a base. Closely related to this type of work are ecological studies in both animal and plant geography.

About every city there are truck gardens and dairy farms that furnish admirable material for study. Truck gardening may well be studied as a type of intensive agriculture. The study of the local type can be made the basis for an understanding of the larger unit, truck gardening in the United States.

If the problem is to explain how a family of say five persons can live apparently as well on a plot of ground of 10 acres as another family of the same size on 100 acres, the solution concerns itself with the way the soil, climate, and markets are manipulated and utilized to their limits. Some of the topics for consideration in regard to soil, besides the usual ones, are: how the soil is made friable; how fertility is retained; why cold soils retard growth; how this retardation may be reduced by methods of tillage, proper drainage, and the use of fertilizers; what the succession of products are during the growing season; how the types of vegetables are adapted to the seasons; and how the canning industry, by taking care of the crop during the off-market season, greatly benefits the truck garden industry.

The extent of losses by untimely frosts, prolonged rains, or prolonged droughts should also be considered; also losses from plant diseases and pests; the influence of climate on their development; how shortage of labor due to excessive seasonal demands, retardation of crops by cold spells or wet weather, and the glutting of the market may result in losses. Data should also be secured on the area in truck gardens, the location and importance of competing areas, and the historic development of the industry in the region.

The types of crops raised in the region are also valuable geographic studies. Each may be investigated along the lines suggested above in the other studies.

The geographer should also be interested in the possible introduction of new crops or the extension of present crops. If geography is to hold its own with other sciences it will have to function in some practical way. It cannot remain merely an academic subject for classroom discussion and survive. In the next century

the people of America must live through the present experiences of the old countries in the intensification of industries. The world view that the geographer enjoys gives him an acquaintance with Old World conditions that no other scientist has. He should be the apostle of the order that is sure to come and should point out the way to a saner and more economic utilization of our resources. For advanced students in the study of the geography of a small area problems dealing with a better utilization of the land of the local region would be both practical and profitable.

The Urban Area

The city with its complex industrial, commercial, and social life offers a wide variety of material for study. The most logical step in the geographic study of a city would be the mapping of the various features that are to receive later investigation.

Mapping Distributions

The maps should show distribution of railroad lines, wharfs, factories, wholesale districts, warehouses, retail districts; distribution of the people classified as to race, nationality, occupation, or wealth; location of parks, schools, and other important features. For simplicity and utility there should be many of these maps, each showing a single distribution or at most related phenomena. A map showing distribution of the factories, lands available for factories in relation to traffic lines, and the areas from which workers may be drawn would prove of value to the business interests. Much practical work may be done in "civic" geography. There could be a map showing the source of the water supply and the portions of the city connected with the water and sewage systems, this to be studied in relation to the map classifying the residences of the city. Maps showing the distribution of typhoid or malarial cases in relation to breeding places for mosquitoes, to water supply, and to sewage disposal would be of great aid to health departments that are struggling for funds in the face of apathetic popular sentiment. Maps of this sort are especially needed in our Southern cities. There is a crying need of reform in the delivery systems in our cities, especially in the delivery of milk and gro-

ceries. Maps showing the routes of the dairy and grocery wagons of the leading firms would indicate at a glance the wastefulness of the present method. The questions of re-routing of street cars; of the best location for new lines; of the selection of streets to be opened to relieve traffic congestion and to provide lower grades for heavy traffic; of the location of new parks, recreation centers, and new schoolhouses—all these are problems that concern the "civic" geographer.

Geographic Influences on City Development

The influence of topography on the plan of the city, on the location of its business sections, residence sections, railroad lines, railroad spurs, passenger and freight depots, wholesale houses, factories, trunk lines of drainage and sewage, and other items is an interesting and instructive problem. So also is the influence of the bed rock and depth of soil on the cost of building, of laying water pipes and other underground conduits, and of street grading. In the same category may be placed climatic influences on the relative (to other regions) cost of building, relative coal bills and ice bills. Further studies on the influence of climate on efficiency of workers, like those carried on by Huntington, are needed. Study of the influence of variations from the mean in temperature and rainfall on local trade conditions is a phase of work that may prove of value to merchants.

A river, navigable or otherwise, may be a feature exerting a profound influence on the life of the people. The Cumberland at Nashville is the source of the city's water supply; it is also the main trunk line in the sewage system; it determines the street pattern in a portion of the city, the location of saw mills, brick factories, sand and gravel yards, and the shipbuilding plant; its great width and high floods make bridge building expensive; and it divides the city and prevents solidarity in civic life. It is an important traffic route, east and west and northwest. The story of its influence in locating the first settlement, of its value to the people before the coming of the railroads, of the decline of river traffic, of government improvements, and of its effect on railroad rates forms an interesting chapter in the commercial history of the city.

HISTORICAL GEOGRAPHY OF A CITY

The story of the founding of the city, the origin of the people, the route by which they came, the attractions the region offered, the geographic conditions that determined the selection of the sites of the first settlements, the economy of the early settlers, and many other items can be made geographic and serve as a background for an understanding of the city as it is today. These bits of historical geography may well be introduced by a visit to the historic landmarks indicated by tablets. Such an acquaintance with these landmarks serves to introduce the problem or problems seeking to determine the geographic factor in the city's growth and industrial development and enables the student better to realize what tremendous changes have been made by man in his reaction to his local and regional environment. Nashville was the nucleus from which people spread over the Middle Tennessee Basin. A study of the influence of topography, soil, rivers, early roads, and railroads in directing this movement is another phase of historical geography that should be investigated.

VALUE OF THE STUDY OF CIVIC GEOGRAPHY

The study of the structure of the city, that is the distribution of the wholesale and retail districts, of the slum and tenement and residential sections, of suburbs and other districts, is clearly in the field of geography in so far as these items can be explained in relation to topographic conditions, prevailing winds, water-supply and drainage conditions, development of traffic lines, and building of factories, and as incident to the expansion of the urban group.

The city is the largest and most satisfactory field for study in the economic geography of a small area. Each plant or industry has its own separate problems, but there are many questions for solution that are pertinent to all, among such are: What advantages does the city offer for this particular type of industry? Why is the plant where it is in the city? What other sites would be as suitable? What is manufactured? Where are the products sold? Is the industry a permanent one? Is the industry complete or primary? To what extent does labor, power, or raw material enter into the value of the product? What relation does this

industry bear to the industrial development and density of population of the region? A study of transportation facilities from sources of raw materials, and coal fields to industries and from industries to markets is a necessary phase of the work. In line with the spirit of our times some consideration should be had of conservation practices and possibilities. Every local industry should be studied in relation to those of that type in the country at large in order that a true picture of its relative importance may be formed.

General Benefits of Field Studies

The benefits to be derived from field studies along the lines suggested above are many. The information obtained is first-hand, real, and serviceable. The student gets in touch with the workaday world and learns to think in terms of what he observes. Field work develops interest. The exhilaration that comes from being an explorer in the field of knowledge stimulates to further investigation. For young men who have not yet chosen their life work industrial studies become vocational guidance studies. One of the most important benefits is the development of the ability to interview managers, superintendents, farmers, workers and get the information desired. Then there are other benefits of a still more practical nature. In an industrial age such as this with ever increasing demands made on scientifically trained men many opportunities are opening to those who have a comprehensive knowledge of industries and commerce. Some of our cities are now paying large sums for industrial surveys, the work now being done by so-called industrial experts, few in number and, in some cases, of doubtful efficiency. Here is a lucrative field for men who are acquainted with economic and commercial geography and are able to use their knowledge in the interpretation of the industrial life of a city. One's local environment may be made to serve as a valuable laboratory for this type of work. Our schools of commerce and administration as well as our institutions for the training of teachers may well devote more time to the study of the geography that is about them.

EDITORIAL NOTE

The above paper deals with a matter of high importance. One of the most urgent of geographical needs is a regional study or a series of regional studies of the United States. Local regional studies carried on by the State Councils of Geography Teachers would furnish the ordinary data needed as the basis of such geographies.

Work of this nature is under progress in Great Britain. By means of its local branches the Geographical Association is participating in a movement known as the "Regional Survey." It has been defined thus:

> Regional Survey stands for an examination of a given region from as many different points of view as possible, its physical features, its history (including in that term its human origins, its folk-lore and traditions and all its archaeological remains), its agriculture and industries, its social and economic problems and not least its future possibilities. The thorough examination and mapping of these aspects of regional life involve the co-operation of many workers, experts in different branches, school teachers and school children, local field clubs and scientific societies. This co-operation of itself is a great gain and it helps to develop regional patriotism, which is a distinct object of the survey movement. (*The Geographical Teacher*, Summer, 1917, p. 94).

Elsewhere the function is seen as Professor Parkins has described it above.

> A school with survey methods may become a centre of civic reference, a training ground for citizenship, a means of raising local government out of its political ditches. A University centre may work even farther in the same direction (A Regional Survey in Relation to Geography, by H. J. Fleure, Oxford, 1915, p. 6).

It is hoped to give an account of the Regional Survey movement in Great Britain in some forthcoming number of the *Journal*.

The object of this note is to call the attention of members of the State Councils and also of Geographical Clubs to the need of fostering local studies and of making their results available to as wide a circle as possible. In this field the example of others is invaluable. The *Journal* should be able to publish outlines for the organization of local studies, examples of the working out of special features, detailed illustrations, suggestive maps. Opinions and suggestions are welcomed.

THE PROBLEM OF TURKEY

The rise of the Ottoman Empire and the entry of western Europe on the Great Age of Discovery are contemporaneous and related events. As the Portuguese navigators pushed farther and farther south along the African coast the Ottoman Empire from its beginnings in western Anatolia spread farther and farther east and west. Under Sulieman the Magnificent and his predecessor, that is shortly after the discovery of America, the bounds of the Empire were carried nearly across Hungary and beyond the Black Sea shores of Russia; from the Mediterranean to the Persian Gulf; along northern Africa to the borders of Morocco. In the late seventeenth century the Empire, with a vast domain astride three continents, the heart of the Old World, had reached its maximum limits. Thence decline set in steady but gradual. Only ten years ago Turkey ruled in Europe an area as large as New England and in Africa an area six times as great, though largely desert. As a result of the war with Italy over Tripoli (1911-1912) and of the Balkan wars, Turkey was relegated to Asia save for Constantinople and a part of eastern Thrace. Even so she retained some 700,000 square miles of territory and some 20,000,000 people.

Natural Regions of Turkey

Asiatic Turkey covers a range of latitude corresponding approximately with that from Boston to Barbados, and an altitudinal range from over 10,000 feet above sea level to more than 1,000 feet below, a hint at its regional diversity which ranges all the way from the snows of Armenia to the coffee fields of Yemen and the hot jungle of the Jordan valley. Six major natural regions may be recognized.

The basis of Ottoman power has always rested in Asia Minor, the mountain-girdled plateau known to the Greeks as Anatolia, the sunrise land. Forests recalling those of Central Europe clothe the bordering heights; but they enclose an arid interior, parched

during the long summer drought, wind-swept and cold during the winter, far more desert-like than anything in Europe. Sharply separated from the interior are the coastal borders. Descent from the plateau to north and south is abrupt. On the Black Sea coast only small triangular plains are found. Conditions on the Mediterranean are similar except that there are important plains about Adalia and Adana (Cilician plain). Westward, however, the plateau descends more gently to the Aegean, and there are more extensive plains about the heads of the numerous bays. With their sharp contours, their intimate connection with the sea, their cultivation of vine and olive, these are true Mediterranean lands.

Beyond the Taurus and Anti-Taurus which mark the natural limit of Anatolia, one passes to a region of increasing altitude, the highlands of Armenia, a region continued across the political boundaries of Persia and the late Russian Empire, Mt. Ararat marking the point where three empires met. This is an extremely broken country of high parallel ridges and deep valleys. Only about Lake Van and in a few of the broadened valleys is there any extent of level surface. Isolation is increased during the winter by the snows which may block the passes for several months. Southward from the Armenian ranges the mountains of Kurdistan look down on the plains of Mesopotamia.

The desert interior of Arabia has always been independent while the borders of the peninsula have almost always been under foreign control. The Ottoman Empire held sovereignty over the so-called "fertile crescent," Syria and Mesopotamia, on the north and the Red Sea borders on the west. Syria is a Mediterranean land, but within its limited compass it includes great diversity of feature and climate from the cedar-crowned Lebanon to the hot depression of the Ghor where dates ripen. Another strip of green in a desert belt is Mesopotamia. The northern part of the western rim of the Arabian plateau is the Hedjaz, the southern part, Yemen and Asir. While the former is desert with a line of scant oases the latter regions, because of their greater altitude and more southerly latitude, have abundant rainfall. Yemen indeed is a fragment of the monsoon countries of the East; with its tropical cultivations it is the exotic garden of Arabia.

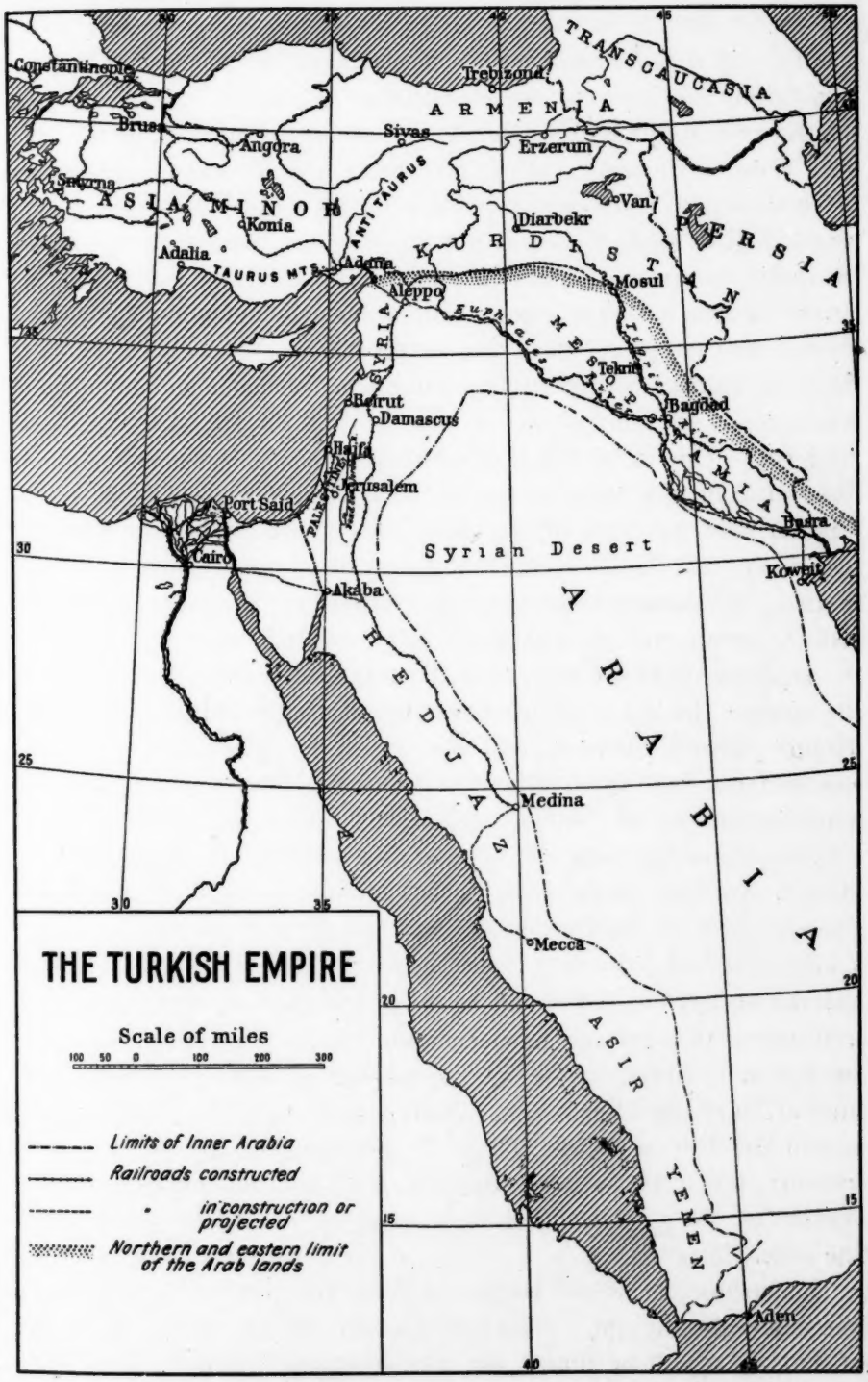

FIG. 1—Map showing the Turkish Empire as it was at the beginning of the war.

THE CITIES

The cities of Turkey are likewise expressive of the diversity of conditions encountered in the Ottoman Empire. Constantinople, at the crossroads of the Old World, at the meeting point of East and West, with its mixture of Byzantine and Ottoman civilizations, is exceedingly cosmopolitan. Smyrna, on a fine harbor, is one of the oldest of Hellenic cities: it has remained persistently Greek through centuries of Turkish rule. Trebizond, on the Black Sea coast, is also a Greek city. Both are at the termini of overland routes and enjoy a flourishing trade. Konia, with its shrines of Moslem saints, is thoroughly Turkish. Situated on one of the main roads of the plateau, it is a market for the stock breeders and rug weavers of the Anatolian plains. The walled cities of Erzerum, on the caravan route from Tabriz, and of Van, by its upland lake, are two of the chief centers of Armenian life. Of Diarbekr, the lawless city of Kurdistan where mingle Turks, Kurds, Armenians, Syrians, and Arabs, it is naturally enough said "there is still no peace within its walls."

Diarbekr is at the head of raft navigation on the Tigris. Downstream are the old cities of enchantment of the Thousand-and-One Nights—Mosul, Bagdad, and Basra. Even Turkish misrule has not entirely destroyed the commercial importance of Bagdad, the glorious capital of Harun Al-Rashid; and lately under foreign interest there has been a revival of Basra, the port of Sindbad the Sailor. In contrast to these ancient trading seats of Mesopotamia are the cities of the Hedjaz—Mecca and Medina—seats of a large traffic drawing travelers from Morocco and Trans-Sahara and uttermost Ind but forbidden to all but Mohammedans. Likewise dependent on spiritual and not on temporal circumstance for greatness is Jerusalem, set on the stony uplands of Judea, holy city of Christian, Jew, and Moslem. Again in sharpest contrast is the naturally favored city of Damascus with its gardens and bazaars, the Arab paradise, market of all the nomads of northern Arabia on the road from Mesopotamia to the Mediterranean and the Nile.

Following the desert border of the fertile crescent northwards one comes to Aleppo, "where, if Turkey were a unity, the center of Turkey would be found, the city where, if anywhere, the races

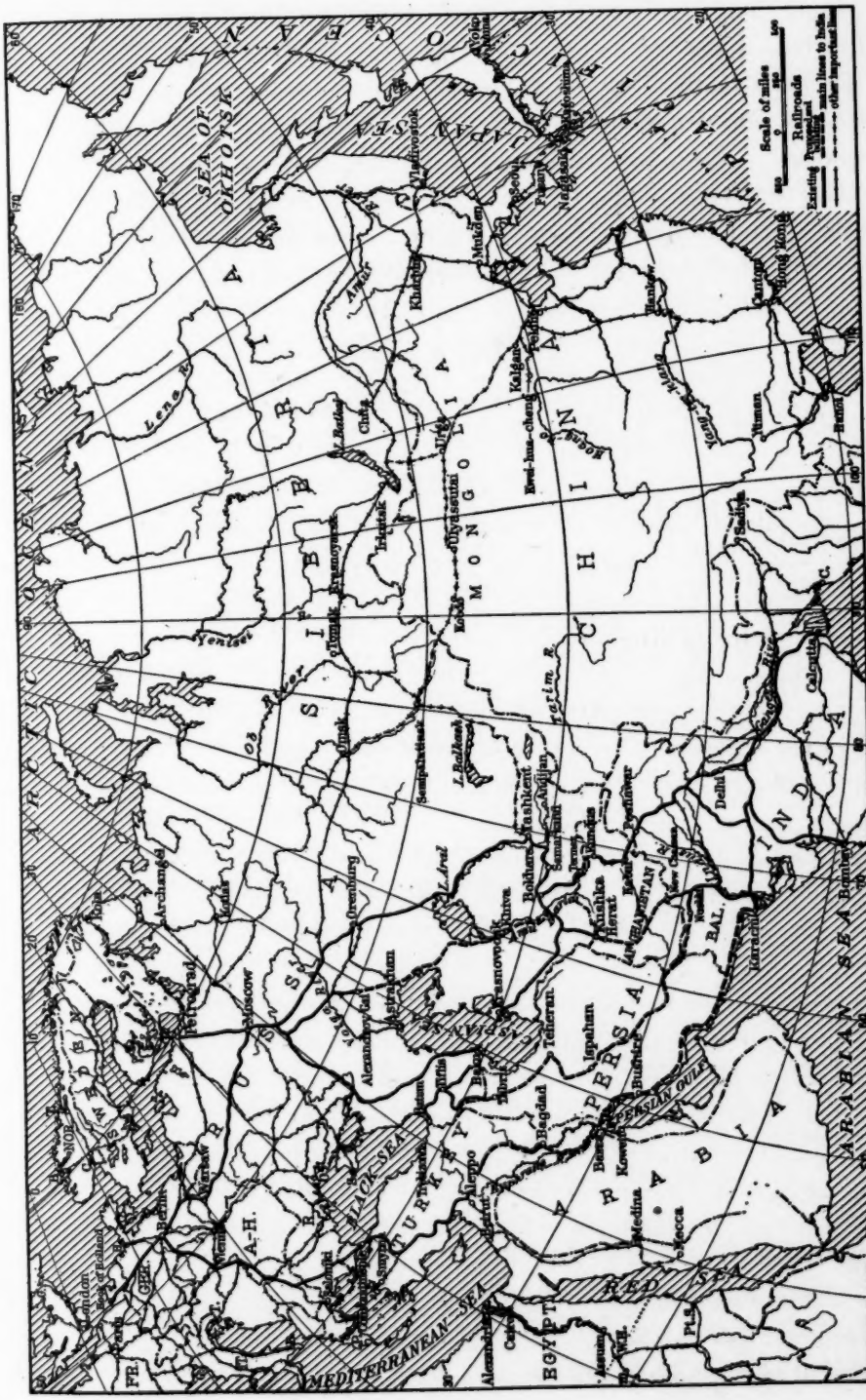

FIG. 2—Map showing the position of Turkey as a thoroughfare or transit land between east and west. This should be compared with a map showing population density. A specially interesting map to use in this connection is "Eurasia: Commercial Development" accompanying the article "A New Series of Economic Maps for School Use" by George Philip, *Geogr. Journ.*, Vol. 50, 1917.

of the Near East have mingled—building their courses into her fortress walls from the polygonal work of the Hittite founders to the battlements that kept out the Crusaders—and now the halfway point of a railway surveyed along an immemorially ancient route." The seaward edge of Syria also has nourished great cities since the earliest days. Today the place of Tyre is taken by Beirut, flourishing under French influence and modernized to the aspect of a European city, the Syrian Smyrna.

The Roads

In this mention of the cities of Turkey their relation to trade routes has been specially remarked. With the exception of the holy cities, all are termini or meeting points of highways connecting three continents. Turkey lies between four seas, the Red, the Mediterranean (with the Aegean), the Black, and the Persian Gulf. These sea ways and their land connections across Turkey afford the easiest routes between the dense populations of the Old World —those of the monsoon lands of the Orient and those of industrial western Europe. The westward extension is comparatively recent; the highways across Turkey are as old as history. The oldest trade routes of the world run from the Persian Gulf through Mesopotamia and Syria to Egypt and there is an honorable antiquity about the caravan routes that run along the length of Anatolia. The most important geographical fact about Turkey is its function as a thoroughfare or transit land.

World highways, however, invite empire as well as trade; and in Turkey times of peace and prosperity have alternated with times of war and destruction. Since the birth of the ancient civilizations of Babylonia and Assyria and Egypt a succession of Empires have held sway over all or part of these lands. Mede and Persian, Greek and Roman, Saracen and Mongol and Turk have followed suit. Turkey has been aptly described as an "everyman's land."

The Peoples

Trade and conquest along these highways have brought diverse peoples into the Turkish lands. The existence of well-defined natural regions has favored the preservation of racial units. Con-

ditions are similar to but more intense than those encountered in the Balkans.

The Turk is the latest comer into these lands. Counting people of Turkish speech he is in a minority for the Empire as a whole; only in Anatolia is he numerically preponderant. And Turkish speech is hardly a criterion of Turkish blood. The so-called Turks of the Ottoman Empire may be divided into three classes: the Osmanli, from whom the Empire got its name, who are the ruling class and are confined to Constantinople and the larger cities; the Turkish nomads who still retain the primitive tribal mode of life; and the settled Anatolian peasantry, a sober and industrious folk, descendants of the original inhabitants mingled with the Turks.

The borders of the Anatolian peninsula, where Mediterranean conditions obtain, are dotted with Greek settlements. The distribution is as characteristic as in the Balkans. The true Greek is found "only as far as a whiff of the salt air carries inland." Armenians are scattered through the peninsula. In the west they are chiefly engaged in commerce in the towns; in the east they are more numerous, but it is only about Lake Van that they become a majority of the population. The Kurds are semi-nomads whose original home is in the eastern mountains, but they have spread over the Armenian lands chiefly through the agency of the Turkish government.

The most distinct ethnic line in Turkey is that about 37° N., forming the northern boundary of the Arab lands and running along the foothills of the Anatolian ranges and Kurdistan. In the Arab lands, however, the populations are even more mixed than in the northern region. Within the desert is the pure-bred Arab, but the desert—"fertile mother but indigent nurse of men"—has from time immemorial been sending out its offspring into the fringes. In Mesopotamia the Arabs have mixed with native elements and with incomers from the east. Syria, with its broken relief of plain and mountain, shelters an extraordinary medley of races and incompatible religious faiths residing side by side. Our very use of the word "philistine" is eloquent of the antagonism, as vigorous today as in Bible times, among diverse inhabitants of the land.

We see then the Ottoman state compounded of a remarkable

variety of lands and peoples, lands without unity, peoples who exhibit little tendency towards racial or cultural assimilation. Yet the Empire has enjoyed a long lease of life. We may well ask why. Certainly it is not efficiency of government such as could be claimed for the Roman Empire. Turkish administration has been a blight on the land, and this fact has long been recognized by the civilized nations of the world. Yet the Turk has remained. In part the Osmanli autocracy has been helped by the very diversity of races and faiths which make for disunity. Furthermore, the Turk has skillfully developed this factor, playing off one people or tribe against another, Kurd against Armenian, Druze of eastern Lebanon against Arab of the plain. The Moslem faith alone gave such unity as has existed, though since the assumption of the Caliphate by the Osmanli[1] this unity has never been assured and has at last broken down. German attempts to stir up the Moslem world by the call for a jihad, or holy war, proved impotent; the Hedjaz joined the Allies. In part the discredited Empire has been preserved by outside interests.

The European Powers and Turkey

European interests in Turkey are of paramont importance in the coming Turkish settlement. These interests may be said to be twofold—interests in the Turkish lands themselves, interest in their situation. It must be realized that before the war the Ottoman Empire was practically mortgaged to European Powers. In the process of running up her enormous indebtedness Turkey had granted extensive concessions to her chief creditors, France, Germany, and Britain, mainly for railroads and mines. Of the railroads in the country only the Hedjaz line, built by the money of pilgrims is Turkish-owned.

Though the Ottoman Empire includes large stretches of mountain and desert, it also possesses areas of great fertility and a climate whose favorableness to the growth of plants valuable to

[1] As successor of the Prophet, the Caliph is head of the Mohammedan world. The Caliph was for long resident in Bagdad. On the sack of Bagdad and execution of the Caliph by the Mongols in 1258 the Caliphate was assumed by members of the same family who fled to Cairo. In the early sixteenth century the Turkish conqueror of Egypt "bought the title, robe and office" for himself and his heirs and successors.

man is shown by the number of food and industrial plants native to the eastern Mediterranean. A distinguishing feature of the Turkish lands is their productivity in such valuable commodities as cotton, silk, tobacco, fine wool, skins, and fruits. The steppe lands of Anatolia are dry, but it is estimated that with irrigation they could annually produce 1,000,000 tons of wheat and 200,000 tons of cotton. Restoration of the ancient irrigation systems of the lower Euphrates and Tigris valley would bring another great granary into existence, and the Zionist colonies in Palestine have proved what can be done there towards agriculture development.

The mineral wealth of Asia Minor is great and varied but little worked as yet. Bituminous coal is mined in the French concession at Heraclea; oil exists in a zone from Trebizond on the Black Sea to the Persian Gulf which offers considerable prospects in the upper Tigris valley. The copper of the Armenian Taurus aroused German interest during the war. Here, then, is a wide range of sources of raw material close to European markets.

Two of the European Powers have had a yet deeper interest in the Turkish lands. Turkey lay in the path of Teuton and Slav advance. Germany, seeking new fields of colonization, penetrated Asia Minor; Russia, seeking a warm-water port, worked toward Constantinople and the Persian Gulf. Both territorial designs have been matters of prime concern for Great Britain—because of the situation of Turkey. As has been said above, Turkey is the bridge giving easy access to India and China. The importance of safeguarding India is seen in Britain's strategic control over the sea route—the stations in the Mediterranean; the protectorate over Egypt; Aden; the "protected" territory of southeastern Arabia; possession of the Kuria Muria Islands. But the sea road has been threatened by the land route projected by Germany as the Berlin-Bagdad railroad over an old caravan route through Anatolia and Mesopotamia.

These are the most salient points, as they appeared at the outbreak of the war, of the age-old conflict over the bridge lands of the Near East. The outcome of the war has been the final accomplishment of that long-protracted event, the break-up of the Turkish Empire.

THE BREAK-UP OF THE TURKISH EMPIRE

It is clear that the Turkish Empire must fall apart along the ethnic line representing the northern limit of the Arab lands. What is to be the disposition of these lands? The break-up of the Austro-Hungarian Empire released suppressed nationalities capable of entering directly upon an independent existence. Within the Ottoman Empire this stage has hardly been reached. The strongest tendency towards nationality here is developed among the Arabs of the Hedjaz. During the war came the Arab revolt. An independent Kingdom of the Hedjaz was recognized by the Allies, and the Hedjaz is looked to as the leader in a federation of independent Arab states; but it is difficult to say of what these should consist and where the frontiers should be drawn. The Arabs of the desert may constitute an ethnic and religious unity; but in the fertile fringes other peoples and creeds are found, and the problem is further complicated by foreign interests.

French interests are paramount in Syria and are of ancient date. Since the days when Phoenician traders founded a settlement at Marseilles there have been commercial relations between France and Syria. Today much French money is invested in Syria. French capital has built all the railroads except the Hedjaz line. The silk factories of Lebanon, the most important industry in the country, were founded by Frenchmen, and their annual product, estimated at a million pounds of silk, is exported to France. And on a less material side French interest in Syria has manifested itself in the establishment of schools and hospitals as was done of old in the time of the Crusades.

Britain has interests in Palestine, especially in relation to the safeguarding of the Suez Canal. In Palestine, however, there is yet another problem. It is that raised by the Zionist ambitions for the foundation of a Jewish state. Ever since their dispersal, the hope of a restoration of their homeland has never failed the Jews, and within the last 50 years active measures have been taken to reëstablish Jews as colonists in the Holy Land. But the Jewish element still forms only one-sixth of the population and can hardly afford a basis for the creation of an independent state. A mandatary or protectorate under Great Britain would appear to be the probable solution.

In the case of both Syria and Palestine delimitation of the eastern boundary of the mandatary powers must prove a delicate question. The Sykes-Picot agreement made between England and France in 1916 gave Aleppo and Damascus and the trans-Jordan country to the independent Arabs—from north to south a debatable strip between the settled population of the fertile western country and the nomads of the desert.

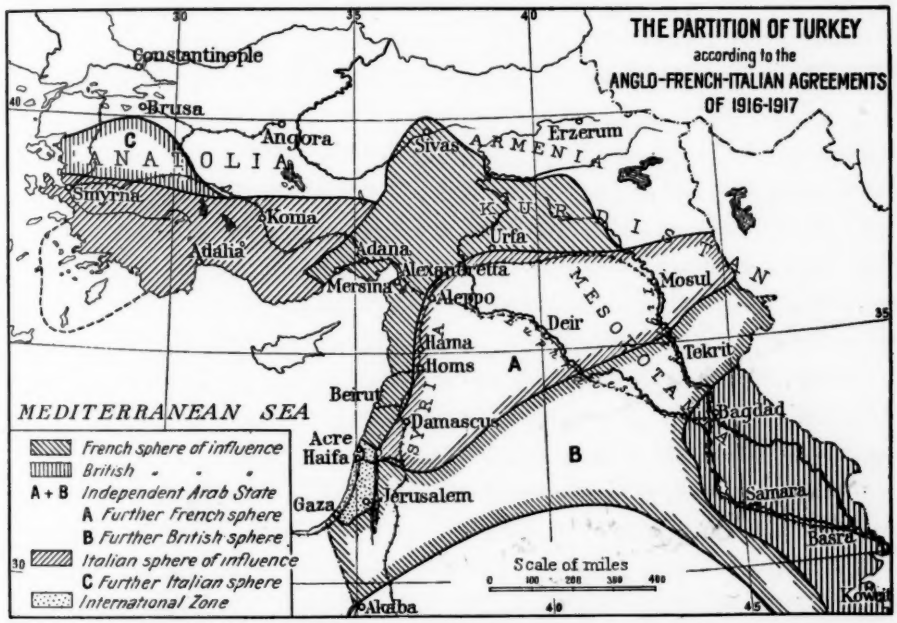

FIG. 3—Map showing the partition of Turkey according to the Anglo-French-Italian agreement of 1916-1917. In May, 1916, the Sykes-Picot agreement was made between England and France. It recognized a French sphere in Syria, Cilicia and southern Armenia and a British sphere in Lower Mesopotamia. The ports of Haifa and Acre also were awarded to England. Palestine was to be an international area. The interior between these spheres was to be an independent Arab state in which, however, further shades of influence were recognized. France was to have priority in zone A; England in zone B. Later Italy was taken into the agreement and was allotted territory in Asia Minor. The map is based upon the reproduction published in *Current History* (Monthly Magazine of the New York Times, March, 1920, p. 501) of the original map attached to the agreement.

According to the same agreement upper Mesopotamia, with Mosul, likewise was awarded to the independent Arabs, lower Mesopotamia being recognized as British. Throughout the last century British influence has been dominant in the Persian Gulf for protection of the approach to India. In lower Mesopotamia economic interests have been manifested especially in the recent schemes for irrigation, part of which has already been put in operation before the war.

In the Ottoman Empire north of the Arab lands one of the most serious problems is that of Armenia. The Armenians are old inhabitants of the land. At times in their history they have existed as an independent nation, but today there are grave problems encountered in the revival of an independent Armenian state. The Armenian population is scattered. There are many Armenians in the large towns from Constantinople eastwards, but only in the Lake Van region does the Armenian form a majority. Furthermore "Armenia" extends beyond the late political boundary of the Turkish Empire into Persian and Transcaucasian territory. Of the actual numbers of the Armenians it is practically impossible to form an estimate. Oppressed from the first days of Ottoman rule, the Armenians have been subjected within the last quarter century to repeated massacre. Under the latest political phase in Turkey, the rise of a Nationalist party, the same policy is being pursued, as is testified by the February massacre in Marash which the French force of occupation, itself attacked and defeated, was powerless to prevent. This latest revival of Turkish strength renders still more problematical the future of a separate Armenia.

Even in the real Turkish lands, in Anatolia proper, there are still other claimants to the borders. The Aegean edges form part of a greater Greece. It presents the old problem of a coastal land with a population different from that of the hinterland. Smyrna in particular is the crucial point. Smyrna is Greek and has been the first city of Asiatic Turkey and the second port of the Empire, its export trade exceeding that of Constantinople. Loss of Smyrna would be a serious economic blow to Turkey, especially as the next best port of Anatolia, Adalia, lies in the field of Italian claims.

CONSTANTINOPLE

The last problem, perhaps the most complex of all, is that of Constantinople and the Straits—the question as to whether or not Turkish power shall remain in Europe. The problem presents economic and strategic as well as psychologic aspects.

Constantinople is one of the world's greatest cities and one of the world's great ports. Its population exceeds a million, and, in

spite of Turkish misgovernment, the city still figures as a commercial center because of its incomparable situation.

Constantinople stands at the crossroads of two great thoroughfares. The age-old land route from east to west will gain in importance as railroad connection is completed. The sea way from southern Russia to the Mediterranean and western Europe which already carries so important a traffic—chiefly grain outward, coal inward—will increase with development of the lands tributary to the Black Sea, lands which at present have a population and productivitiy small in comparison with their capabilities.

With such an economic status the strategic situation of Constantinople assumes extraordinary importance. The incompetency and untrustworthiness of the Turkish government calls for "a different porter at the gates."

But Constantinople is also of capital importance in spiritual matters. For a thousand years, during her most glorious days, the city was head of the Eastern Church and enjoyed a prestige that survived all political change, becoming incorporated with her later preëminence in the Mohammedan world. When the head of the Osmanli overthrew the Abbasid Caliphate he took to himself the spiritual headship of the Moslems, and as such he is still recognized by a large part of this great congregation. There are 60,000,000 Moslems among the 315,000,000 people of India. Their spiritual allegiance has lain in the Turkish Empire: what would be the consequence of uprooting the tradition of so fanatical a people?

As has been said before, the peculiarity of the countries of the Ottoman Empire lies in their far-reaching relations with other lands. Since the dawn of history they have played a potent part in great world movements and events. Their destiny is no less fraught with consequence today.

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Empire, London, 1915. Contains historical maps. Maps in Shepherd's Historical Atlas should also be consulted.

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MAPS

The course of events relating to territorial changes in the Turkish Empire should be followed in the newspapers and such magazines as *Current History* (Monthly Magazine of the New York Times). When the actual terms are announced the new political map can be constructed by drawing the new boundaries on any suitable base. Such bases are provided in the series of maps made by the American Geographical Society for the Peace Conference. Further information regarding them will be found in the advertising pages of this number of the *Journal.*

A STUDY IN HOME GEOGRAPHY

THE TEACHER'S PROBLEM IN A CITY OF FACTORIES

By BRETA W. CHILDS

State Normal School, Worcester, Mass.

Educators generally agree that geography in the elementary grades properly deals with the subject matter which the environment of the child furnishes. In a city of about 170,000 inhabitants the writer has been considering how to acquaint children with some of the important geographic principles and historical and economic reasons underlying the presence of the several hundred manufacturing plants upon which they and their parents are dependent for their livelihood.

The important task of the teacher is to simplify the work so that it may have real educational value for children in the third and fourth grades of the elementary school. The study of modern industry in the home city is a prerequisite for the study of manufacturing in other cities. It is also a foundation for any industrial study in geography. The writer hopes that some teacher in an elementary school situated in a manufacturing city may be led to

put into practice the theory of procedure here presented for consideration and to give to the writer the benefit of the result.

The unit of work presented is organized for Worcester, Massachusetts. Several factories were visited. From these a factory in which rugs were made from wool was selected as suitable for study by third and fourth grade children.

The course was then planned and outlined for the teacher. It divides itself into *Industrial Arts* (A) and *Geography* (B). The study of these two divisions should be simultaneous.

Course for Third Grade

A. *Manufacturing textiles*
- a. Examination of kinds of cloth
  1. Cotton
  2. Wool
  3. Linen
  4. Silk
- b. List of products made from these materials
- c. Sources of these materials
- d. A detailed study of the manufacture of a textile made from one of them, e. g. woolen cloth
  1. Shearing
     Pictures and stories
  2. Spinning
     Pictures of spinners at work
     Observation of a woman spinning
     Examination of samples obtained from a factory showing steps from shearing to spinning
  3. Dyeing
     Experiments in dyeing yarns for use in weaving
  4. Weaving
     Examination of cloth to discover the principle of weaving
     The making of a loom and the weaving of a useful article
     A trip to the Worcester Art Museum School of Crafts to see rugs being woven on hand looms

B. *Life of shepherd peoples*
- a. Arabians or Bedouins
- b. Persians
- c. Navajo Indians

In the fourth grade the course outlined above for the study of textiles along with the study of textile peoples may be continued with a more advanced study, suggested by the following outline.

COURSE FOR FOURTH GRADE

A. *Manufacturing textiles*

A trip to a modern industrial plant, the Whittall rug factory

a. A loom at work
   Power—need of coal
   Inventors—Crompton, Knowles, Jacquard
b. Division of labor
   Dyers, weavers, etc.
c. Interdependence of industries
   Need of other manufacturing plants—machines, belting, spools, dyes
   Need of producers of raw material—shepherds, miners, lumbermen
d. Market for goods
e. Need of transportation
f. Competition

B. *Study of shepherd peoples*

1. Life on the Great Plains
2. Life on the Argentine pampas.
3. Life on the Asiatic steppes
4. Life on the Australian downs
5. Life in the Alps

Examination of the outline indicates how the trip to the factory may be made the basis for a part of the map and globe study of the fourth grade. On the return from the factory the railroad routes to the city will be noted and recorded on the city map. The need of locating the areas of the production of the raw material will lead to globe study and the use of product maps of the world. Trade routes from these regions to Boston, the second largest wool market in the world, will be noted. Stories of the life of shepherd peoples make the continents acquire meaning as the work progresses.

ILLUSTRATIVE MATERIAL NEEDED

1. Pictures

   The teacher should have access to numbers of the National Geographic Magazine. If possible, she should cut out and mount pictures. They may then be hung in the room or placed in the hands of the children for study. Several pictures of spinners, of weavers, of shepherds and their flocks, and of wool and rug markets have been obtained from this source. The magazine *Asia* also publishes some excellent pictures.

2. Samples
   a. Cotton
      Bolls may be raised from seeds planted in the schoolroom. Sample bolls may be obtained by writing to state agricultural colleges in the growing region.
   b. Wool
      Factories engaged in spinning will furnish the teacher with wool direct from the sheep, washed and carded, and wool in the several stages of spinning.
   c. Flax
      Flax may be raised, or samples may be obtained from the region where it grows.
   d. Silk
      Excellent illustrative material may be purchased from the Cheney Manufacturing Company, South Manchester, Connecticut.
3. Sand table
   For representing the Bedouin nomad with his flock, ranch life, a lumber camp, etc.
4. Books
   a. "Weavers and Other Workers," by Jennie Hall (Rand, McNally & Co.)
      This work contains a wealth of material for little children. Pictures, poems, stories of shepherd peoples and dyers and weavers, and directions for the accompanying project work are included.
   b. "The Four Wonders"—Cotton, Wool, Linen, Silk, by E. E. Shillig (Rand, McNally & Co.) The complete story of manufacture, beginning with the production of the raw material, is given. The book is indispensable for third-grade children.
   c. "Seven Little Sisters"; "Each and All," by Jane Andrews (Ginn & Co.)
      Contain a story of Arabian child life, showing the life of a nomad with his flock, and are adapted for third-grade children.
   d. "The Farmer and His Friends," by E. M. Tappan (Houghton, Mifflin Co.)
      Contains an interesting chapter on the ways of sheep which may be read to the children by the teacher.
   e. "How We Are Clothed," by J. F. Chamberlain (The Macmillan Co.)
      Familiar to many teachers for its comprehensive treatment of textiles.
      Fourth-grade children can read this book.

f. "School Economic Atlas," by Bartholomew & Lyde (Oxford University Press)
Contains maps showing grasslands and the distribution of sheep throughout the world.

5. Physical and political maps of the continents
6. Outline maps

The writer has purposely planned the course to center about one industry. It is assumed that children in certain parts of Worcester could not visit this factory, and another industry would have to be selected for them. One teacher in this city has successfully associated the study of a cold storage plant with the study of farming. A teacher must take conditions as she finds them and work out her own basis of relationship. The writer does insist that it is time for teachers to find some basis of connection for the work in geography in the primary grades. Too often teachers develop with children isolated topics in geography, history, industrial arts or literature, according to the course provided by the city system. The relation of the topic to the whole scheme of work is thus ignored, and much of the cultural value of school work is lost.

GEOGRAPHICAL PUBLICATIONS

The Project Method in Education. By Mendel E. Branom. 282 pp.; bibliogr., index. Richard G. Badger, Boston, 1919. $1.75. 8 x 5½.

The book contains not only much information concerning the project method in education, both theoretical and practical, but also much sound pedagogy and good common sense. Though a strong advocate of the project method, the author does not take an extreme view nor does he attempt to center all school work around it. To quote his own words, "To attempt to organize all school work about project problems is unwise. Much of the school work should undoubtedly center around project problems, but to seek to organize a course of study exclusively about them, always conspicuously setting them up before the pupil, is to set up an artificial, formal organization that does not by any means exclusively and dominantly prevail in adult life."

In the opening chapter the author deals in some detail with the idea that the project method is the way of growth through which man is dif-

ferentiated from other animals. The animal instinctively makes certain adjustments to his environment. Man, in common with the others, also makes these instinctive adjustments, but he can also think, plan, and engage in sustained thought, and can intellectualize his activities in a way that differentiates him from other animals. The public schools have been established not with the idea of preparing the children for an animal existence, but for the purpose of fitting them for human existence. It follows, therefore, that the activities of the school are concerned primarily with the project method, which is Nature's particular way of developing the child as a human being.

Having thus established the necessity of using the project method in education, the author points out its abuses, its dependence on the child's personal world as a starting point, and the necessity of the teacher's realizing the steps by which the child moves from his personal world farther into the larger world.

The second chapter deals with the evolution of the project from the general to the specific vocabulary of the educational field. Having established the place of the project in the educational world, the significance of motivation in school work, and the opportunity given by the project method for motivating that work, the author then deals more in detail with methods of teaching by this modern method of learning by means of it, and the difference between project questions, project exercises, and project problems.

Manual projects receive an entire chapter. So also do history and geography. These are the subjects in the school curriculum which lend themselves most readily to the project method. These chapters are valuable not only because of the information given concerning the connection of geography and history with and their development through the project method, but also because of the significant topics which are discussed. For example, in the chapter on history the less provincial aspect of the subject which should be dealt with in the schools, and the need of placing more emphasis on present history and the making of history that is going on under our eyes, are treated at some length.

In the chapter on geography the teaching of the subject through project questions, project exercises, and project problems is discussed, as are also many other important phases, such as the present great interest in geography and its reflection in the schools, the relation between life forms and physical environment, types of lessons, and need of motivation and the methods by which it can be accomplished.

The reorganization of the course of study with the project method in mind, and the preparation of the teacher, are each discussed at length. At the close of the book a lengthy list of references on the topics considered in the different chapters is given.

The book is a contribution to the professional literature of the teacher.

Much benefit may be derived from it especially if the teacher will read it slowly and digest it thoroughly. It will make for a decided growth on the part of the reader if he will read one chapter at a time, work out some of the very suggestive questions and problems given, put the ideas gained into practical use in the school-room, and note the results.

One cannot read the pages on the "project of life" without gaining some inspiration for one's own life project and pausing to reflect somewhat on the nature of that project and its aims.

One not only agrees with the statement that "the acme of good teaching is reached in getting the child to engage whole-heartedly in worthwhile, purposeful activity," but is grateful to the author for putting this aim of every good teacher into so concise and appealing a form.

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NOTICE

The May issue of the *Journal of Geography* will be devoted to Prize Essays. If extra copies of this important number are desired they should be ordered without delay that a sufficiently large edition may be printed.

Many requests have been received for the *Journal of Geography*, Vol. 15, No. 9 (May, 1917). The office of the *Journal* will be glad to buy copies of this number at 15 cents each.

For an opportunity to obtain back numbers of the *Journal* see the advertisement on the opposite page.